

What is claimed is:

1 1. A DNA sequence encoding a polypeptide of the  
2 formula

3 WYBAZCX

4 wherein WYBAZCX is composed of the polypeptide  
5 segments shown in Figure 31 (SEQ ID Nos. 136-139, 141-147,  
6 160, 161, and 163); wherein W comprises polypeptide segment  
7 F, or is absent; wherein Y comprises polypeptide segment E,  
8 or is absent; wherein Z comprises polypeptide segment G or  
9 is absent; and wherein X comprises polypeptide segments C/D  
10 HKL, C/D H, C/D HL, C/D D, C/D' HL, C/D' HKL, C/D' H, C/D'  
11 D, C/D C/D' HKL, C/D C/D' H, C/D C/D' HL, C/D C/D' D, C/D D'  
12 H, C/D D' HL, C/D D' HKL, C/D' D' H, C/D' D' HKL, C/D C/D'  
13 D' H, C/D C/D' D' HL, C/D C/D' D' HKL, or C/D' D' HL;  
14 provided that, either

15 a) at least one of F, Y, B, A, Z, C, or X is of  
16 bovine origin; or

17 b) Y comprises polypeptide segment E; or

18 c) X comprises polypeptide segments C/D HKL, C/D D,  
19 C/D' HKL, C/D C/D' HKL, C/D C/D' D, C/D D' H, C/D D' HL, C/D  
20 D' HKL, C/D' D' H, C/D' D' HKL, C/D C/D' D' H, C/D C/D' D'  
21 HL, C/D C/D' D' HKL, C/D'H, C/D C/D'H, or C/D C/D'HL.

1 2. The DNA sequence of claim 1, wherein X  
2 comprises polypeptide segments C/D HKL having the amino acid  
3 sequences shown in Figure 31 (SEQ ID Nos. 136-139, 141-142,  
4 146, 147, 160, 161).

1           3.    The DNA sequence of claim 1, wherein X  
2   comprises polypeptide segments C/D' H having the amino acid  
3   sequences shown in Figure 31 (SEQ ID Nos. 136-139, 141, 143,  
4   146, 160).

1           4.    The DNA sequence of claim 1, wherein X  
2   comprises polypeptide segments C/D D having the amino acid  
3   sequences shown in Figure 31 (SEQ ID Nos. 136-139, 141, 142,  
4   144, 160).

1           5.    The DNA sequence of claim 1, wherein X  
2   comprises polypeptide segments C/D' HKL having the amino  
3   acid sequences shown in Figure 31 (SEQ ID Nos. 136-139, 141,  
4   143, 146, 147, 160, 161).

1           6.    The DNA sequence of claim 1, wherein X  
2   comprises polypeptide segments C/D C/D' HKL having the amino  
3   acid sequences shown in Figure 31 (SEQ ID Nos. 136-139, 141-  
4   143, 146, 147, 160, 161).

1           7.    The DNA sequence of claim 1, wherein X  
2   comprises polypeptide segments C/D C/D' H having the amino  
3   acid sequences shown in Figure 31 (SEQ ID Nos. 136-139, 141-  
4   143, 146, 160).

1           8.    The DNA sequence of claim 1, wherein X  
2   comprises polypeptide segments C/D C/D' HL having the amino  
3   acid sequences shown in Figure 31 (SEQ ID Nos. 136-139, 141-  
4   143, 146, 147, 160).

1           9. The DNA sequence of claim 1, wherein X  
2 comprises polypeptide segments C/D C/D' D having the amino  
3 acid sequences shown in Figure 31 (SEQ ID Nos. 136-139, 141-  
4 144, 160).

1           10. The DNA sequence of claim 1, wherein X  
2 comprises polypeptide segments C/D D'H having the amino acid  
3 sequences shown in Figure 31 (SEQ ID Nos. 136-139, 141-142,  
4 145, 146, 160).

1           11. The DNA sequence of claim 1, wherein X  
2 comprises polypeptide segments C/D D'H L having the amino  
3 acid sequences shown in Figure 31 (SEQ ID Nos. 136-139, 141-  
4 142, 145, 146, 147, 160).

1           12. The DNA sequence of claim 1, wherein X  
2 comprises polypeptide segments C/D D'H K L having the amino  
3 acid sequences shown in Figure 31 (SEQ ID Nos. 136-139, 141-  
4 142, 145-147, 160, 161).

1           13. The DNA sequence of claim 1, wherein X  
2 comprises polypeptide segments C/D' D' H having the amino  
3 acid sequences shown in Figure 31 (SEQ ID Nos. 136-139, 141,  
4 143, 145, 146, 160).

1           14. The DNA sequence of claim 1, wherein X  
2 comprises polypeptide segments C/D' D' H K L having the  
3 amino acid sequences shown in Figure 31 (SEQ ID Nos. 136-  
4 139, 141, 143, 145-147, 160, 161).

1 15. The DNA sequence of claim 1, wherein X  
2 comprises polypeptide segments C/D C/D' D' H having the  
3 amino acid sequences shown in Figure 31 (SEQ ID Nos. 136-  
4 139, 141-143, 145, 146, 160).

1 16. The DNA sequence of claim 1, wherein X  
2 comprises polypeptide segments C/D C/D' D' H L having the  
3 amino acid sequences shown in Figure 31 (SEQ ID Nos. 136-  
4 139, 141-143, 145-147, 160).

1 17. The DNA sequence of claim 1, wherein X  
2 comprises polypeptide segments C/D C/D' D' H K L having the  
3 amino acid sequences shown in Figure 31 (SEQ ID Nos. 136-  
4 139, 141-143, 145-147, 160, 161).

1 18. The DNA sequence comprising coding segments  
2 5'FBA<sup>3</sup>' coding for polypeptide segments having the amino  
3 acid sequences shown in Figure 31 (SEQ ID Nos. 136, 138,  
4 139).

1 19. The DNA sequence comprising coding segments  
2 5'FBA<sup>3</sup>' coding for polypeptide segments having the amino  
3 acid sequences shown in Figure 31 (SEQ ID Nos. 136, 138,  
4 140).

1 20. The DNA sequence comprising coding segments  
2 5'FEBA<sup>3</sup>' coding for polypeptide segments having the amino  
3 acid sequences shown in Figure 31 (SEQ ID Nos. 136-139,  
4 163).

1           21. The DNA sequence comprising coding segments  
2   5'FEBA'3' coding for polypeptide segments having the amino  
3   acid sequence shown in Figure 31 (SEQ ID Nos. 136-138, 140,  
4   163).

1           22. Purified DNA encoding GGF2HBS5.

1           23. A polypeptide of the formula

2                               WYBAZCX

3           wherein WYBAZCX is composed of the polypeptide  
4   segments shown in Figure 31 (SEQ ID Nos. 136-139, 141-147,  
5   160, 161, 163); wherein W comprises polypeptide segment F,  
6   or is absent; wherein Y comprises polypeptide segment E, or  
7   is absent; wherein Z comprises polypeptide segment G or is  
8   absent; and wherein X comprises peptide segments C/D HKL,  
9   C/D H, C/D HL, C/D D, C/D' HL, C/D' HKL, C/D' H, C/D' D, C/D  
10   C/D' HKL, C/D C/D' H, C/D C/D' HL, C/D C/D' D, C/D D' H, C/D  
11   D' HL, C/D D' HKL, C/D' D' H, C/D' D' HKL, C/D C/D' D' H,  
12   C/D C/D' D' HL, C/D C/D' D' HKL, or C/D' D' HL; provided  
13   that, either

14           a) at least one of F, Y, B, A, Z, C, or X is of  
15   bovine origin; or

16           b) Y comprises polypeptide segment E; or

17           c) X comprises polypeptide segments C/D HKL, C/D'  
18   HKL, C/D D, C/D C/D' HKL, C/D C/D' D, C/D D' H, C/D D' HL,  
19   C/D D' HKL, C/D' D' H, C/D' D' HKL, C/D C/D' D' H, C/D C/D'  
20   D' HL, C/D C/D' D' HKL, C/D'H, C/D C/D'H, or C/D C/D'HL.

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1 24. A polypeptide of claim 23, wherein X comprises  
2 C/D HKL polypeptide segments having the amino acid sequences  
3 shown in Figure 31 (SEQ ID Nos. 136-139, 141-142, 146, 147,  
4 160, 161).

1 25. A polypeptide of claim 23, wherein X comprises  
2 C/D D polypeptide segments having the amino acid sequences  
3 shown in Figure 31 (SEQ ID Nos. 136-139, 141, 142, 144,  
4 160).

1 26. A polypeptide of claim 23, wherein X comprises  
2 C/D' H polypeptide segments having the amino acid sequences  
3 shown in Figure 31 (SEQ ID Nos. 136-139, 141, 143, 146,  
4 160).

1 27. A polypeptide of claim 23, wherein X comprises  
2 C/D' HKL polypeptide segments having the amino acid  
3 sequences shown in Figure 31 (SEQ ID Nos. 136-139, 141, 143,  
4 146, 147, 160, 161).

1 28. A polypeptide of claim 23, wherein X comprises  
2 C/D C/D' HKL polypeptide segments having the amino acid  
3 sequences shown in Figure 31 (SEQ ID Nos. 136-139, 141-143,  
4 146, 147, 160, 161).

1 29. A polypeptide of claim 23, wherein X comprises  
2 C/D C/D' H polypeptide segments having the amino acid  
3 sequences shown in Figure 31 (SEQ ID Nos. 136-139, 141-143,  
4 146, 160).

1           30. A polypeptid f claim 23, wh r in X ompris s  
2 C/D C/D' HL polypeptid segments having th amin acid  
3 sequences shown in Figure 31 (SEQ ID Nos. 136-139, 141-  
4 143,146, 147, 160).

1           31. A polypeptide of claim 23, wherein X comprises  
2 C/D C/D' D, polypeptide segments having the amino acid  
3 sequences shown in Figure 31 (SEQ ID Nos. 136-139, 141-144,  
4 160).

1           32. A polypeptide of claim 23, wherein X comprises  
2 C/D D'H polypeptide segments having the amino acid  
3 sequences shown in Figure 31 (SEQ ID Nos. 136-139, 141, 142,  
4 145, 146, 160).

1           33. A polypeptide of claim 23, wherein X comprises  
2 C/D D'H L polypeptide segments having the amino acid  
3 sequences shown in Figure 31 (SEQ ID Nos. 136-139, 141, 142,  
4 145-147, 160).

1           34. A polypeptide of claim 23, wherein X comprises  
2 C/D D'H K L polypeptide segments having the amino acid  
3 sequences shown in Figure 31 (SEQ ID Nos. 136-139, 141, 142,  
4 145-147, 160, 161).

1           35. A polypeptide of claim 23, wherein X comprises  
2 C/D' D' H polypeptide segments having the amino acid  
3 sequences shown in Figure 31 (SEQ ID Nos. 136-139, 141, 143,  
4 145, 146, 160).

1 36. A polypeptide of claim 23, wherein X comprises  
2 C/D' D' H K L polypeptide segments having the amino acid  
3 sequences shown in Figure 31 (SEQ ID Nos. 136-139, 141, 143,  
4 145-147, 160, 161).

1 37. A polypeptide of claim 23, wherein X comprises  
2 C/D C/D' D' H polypeptide segments having the amino acid  
3 sequences shown in Figure 31 (SEQ ID Nos. 136-139, 141-143,  
4 145, 146, 160).

1 38. A polypeptide of claim 23, wherein X comprises  
2 C/D C/D' D' H L polypeptide segments having the amino acid  
3 sequences shown in Figure 31 (SEQ ID Nos. 136-139, 141-143,  
4 145-147, 160).

1 39. A polypeptide of claim 23, wherein X comprises  
2 C/D C/D' D' H K L polypeptide segments having the amino acid  
3 sequences shown in Figure 31 (SEQ ID Nos. 136-139, 141-143,  
4 145-147, 160, 161).

1 40. A polypeptide comprising FBA polypeptide  
2 segments having the amino acid sequences shown in Figure 31  
3 (SEQ ID Nos. 136, 138, 139).

1 41. A polypeptide comprising FEBA polypeptide  
2 segments having the amino acid sequences shown in Figure 31  
3 (SEQ ID Nos. 136-139, 163).

1 42. A polypeptide comprising FBA' polypeptide  
2 segments having the amino acid sequences shown in Figure 31  
3 (SEQ ID Nos. 136, 139, 140).



1 43. A polypeptide comprising FEBA' polypeptide  
2 segments having the amino acid sequences shown in Figure 31  
3 (SEQ ID Nos. 136-139, 140, 163).

1 44. Purified GGF2HBS5 polypeptide.

1 45. A basic polypeptide factor having mitogenic  
2 activity stimulating the division of Schwann cells in the  
3 presence of fetal calf plasma, said polypeptide having a  
4 molecular weight of from about 30 kD to about 36 kD, said  
5 polypeptide including within its amino acid sequence any one  
6 or more of the following polypeptide sequences:

7 F K G D A H T E  
8 A S L A D E Y E Y M X K  
9 T E T S S S G L X L K  
10 A S L A D E Y E Y M R K  
11 A G Y F A E X A R  
12 T T E M A S E Q G A  
13 A K E A L A A L K  
14 F V L Q A K K  
15 E T Q P D P G Q I L K K V P M V I G A Y T  
16 E Y K C L K F K W F K K A T V M  
17 E X K F Y V P  
18 K L E F L X A K

1 46. A basic polypeptide factor having mitogenic  
2 activity stimulating the division of Schwann cells in the  
3 presence of fetal calf plasma, said polypeptide having a  
4 molecular weight of from about 55 kD to about 63 kD, and  
5 said polypeptide including within its amino acid sequence  
6 any one or more of the following peptide sequences:

7 V H Q V W A A K  
 8 Y I F F M E P E A X S S G  
 9 L G A W G P P A F P V X Y  
 10 W F V V I E G K  
 11 A S P V S V G S V Q E L V Q R  
 12 V C L L T V A A L P P T  
 13 K V H Q V W A A K  
 14 K A S L A D S G E Y M X K  
 15 D L L L X V  
 16 E G K V H P Q R R G A L D R K  
 17 P S C G R L K E D S R Y I F F M E  
 18 E L N R K N K P Q N I K I Q K K

1 47. A method for stimulating mitogenesis of a glial  
 2 cell, said method comprising contacting said glial cell with  
 3 a polypeptide defined by the formula

WYBAZCX

4  
 5 wherein WYBAZCX is composed of the polypeptide  
 6 segments shown in Figure 31 (SEQ ID Nos. 136-139, 141-147,  
 7 160, 161, 163); wherein W comprises polypeptide segment F,  
 8 or is absent; wherein Y comprises polypeptide segment E, or  
 9 is absent; wherein Z comprises polypeptide segment G or is  
 10 absent; and wherein X comprises polypeptide segments C/D  
 11 HKL, C/D H, C/D HL, C/D D, C/D' HL, C/D' HKL, C/D' H, C/D'  
 12 D, C/D C/D' HKL, C/D C/D' H, C/D C/D' HL, C/D C/D' D, C/D D'  
 13 H, C/D D' HL, C/D D' HKL, C/D' D' H, C/D' D' HL, C/D' D'  
 14 HKL, C/D C/D' D' H, C/D C/D' D' HL, or C/D C/D' D' HKL.

1 48. A method for stimulating mitogenesis of a glial  
2 cell, said method comprising contacting said glial cell with  
3 a polypeptide comprising FBA polypeptide segments having the  
4 amino acid sequences shown in Figure 31 (SEQ ID Nos. 136,  
5 138, 139).

1 49. A method of stimulating mitogenesis of a glial  
2 cell, said method comprising contacting said glial cell with  
3 a polypeptide comprising FBA' polypeptide segments having  
4 the amino acid sequences shown in Figure 31 (SEQ ID Nos.  
5 136, 138, 140).

1 50. A method of stimulating mitogenesis of a glial  
2 cell, said method comprising contacting said glial cell with  
3 a polypeptide comprising FEBA polypeptide segments having  
4 the amino acid sequences shown in Figure 31 (SEQ ID Nos.  
5 136-139, 163).

1 51. A method of stimulating mitogenesis of a glial  
2 cell, said method comprising contacting said glial cell with  
3 a polypeptide comprising FEBA' polypeptide segments having  
4 the amino acid sequences corresponding to polypeptide  
5 segments shown in Figure 31 (SEQ ID Nos. 136-138, 140, 163)  
6 to glial cells.

1 52. A method of stimulating mitogenesis of a glial  
2 cell, said method comprising contacting said glial cell with  
3 GGF2HBS5 polypeptide.

1 53. A method of stimulating mitogenesis of a glial  
2 cell said method comprising contacting said glial cell with  
3 a compound which specifically binds the p185<sup>erbB2</sup> receptor  
4 of glial cells.

1 54. A method of stimulating mitogenesis of a glial  
2 cell, said method comprising contacting said glial cell with  
3 a polypeptide, comprising EGFL1, having the amino acid  
4 sequence shown Fig. 38, Seq. ID No. 154.

1 55. A method of stimulating mitogenesis of a glial  
2 cell, said method comprising contacting said glial cell with  
3 a polypeptide, comprising EGFL2, having the amino acid  
4 sequence shown in Figure 39, Seq. ID No. 155.

1 56. A method of stimulating mitogenesis of a glial  
2 cell, said method comprising contacting said glial cell with  
3 a polypeptide, comprising EGFL 3, with the amino acid  
4 sequence shown in Fig. 40, Seq. ID No. 156.

1 57. A method of stimulating mitogenesis of a glial  
2 cell, said method comprising contacting said glial cell with  
3 a polypeptide, comprising EGFL4, with the amino acid  
4 sequence shown in Fig. 41, Seq. ID No. 157.

1 58. A method of stimulating mitogenesis of a glial  
2 cell, said method comprising contacting said glial cell with  
3 a polypeptide, comprising EGFL5, with the amino acid  
4 sequence shown in Fig. 42, Seq. ID No. 158, to glial cells.

1 59. A method of stimulating mitogenesis of a glial  
2 cell, said method comprising contacting said glial cell with  
3 a polypeptide, comprising EGFL6, with the amino acid  
4 sequence shown Fig. 43, Seq. ID No. 159.

1 60. A method for the prophylaxis or treatment of a  
2 pathophysiological condition of the nervous system in a  
3 mammal in which said condition involves a cell type which is

4 sensitiv r r sponse to a polypeptide as defin d in any  
5 on of claims 1 and 18-22, said method comprising  
6 administering to said mammal an effective amount of said  
7 polypeptide.

1 61. A method as claimed in claim 60, wherein said  
2 condition involves peripheral nerve damage.

1 62. The method as claimed in claim 60, wherein said  
2 condition involves glia of the central nervous system.

1 63. A method of stimulating mitogenic activity in a  
2 glial cell, said method comprising applying 35 kD  
3 polypeptide factor isolated from the rat I-EJ transformed  
4 fibroblast cell line to said glial cell.

1 64. A method of stimulating mitogenic activity in a  
2 glial cell, said method comprising applying 75 kD  
3 polypeptide factor isolated from the SKBR-3 human breast  
4 cell line to said glial cell.

1 65. A method of stimulating mitogenic activity in a  
2 glial cell, said method comprising applying 44 kD  
3 polypeptide factor isolated from the rat I-EJ transformed  
4 fibroblast cell line to said glial cell.

1 66. A method of stimulating mitogenic activity in a  
2 glial cell, said method comprising applying 45 kD  
3 polypeptide factor isolated from the MDA - MB 231 human  
4 breast cell line to said glial cell.

1 67. A method of stimulating mitogenic activity in a  
2 glial cell, said method comprising applying 7 to 14 kD  
3 polypeptide factor isolated from the ATL-2 human T-cell line  
4 to said glial cell.

1 68. A method of stimulating mitogenic activity in a  
2 glial cell, said method comprising applying 25 kD  
3 polypeptide factor isolated from activated mouse peritoneal  
4 macrophages to said glial cell.

1 69. A method of stimulating mitogenic activity in a  
2 glial cell, said method comprising applying a 25 kD  
3 polypeptide factor isolated from bovine kidney to said glial  
4 cell.

1 70. A method of stimulating mitogenic activity in a  
2 glial cell, said method comprising applying ARIA polypeptide  
3 to said glial cell.

1 71. A polypeptide factor having glial cell  
2 mitogenic activity and including an amino acid sequence  
3 encoded by:-

4 (a) a DNA sequence shown in any one of Figures 28a,  
5 28b or 28c (SEQ ID Nos. 133-135, respectively).

6 (b) a DNA sequence shown in Figure 22 (SEQ ID No.  
7 89);

8 (c) the DNA sequence represented by nucleotides  
9 281-557 of the sequence shown in Figure 28a.

10 (d) a DNA sequence hybridizable to any one of the  
11 DNA sequences according to (a), (b) or (c).

1           72. A basic polypeptid fact r having a mol cular  
2 weight, whether in reducing conditions or not, of from about  
3 30 kD to about 36 kD on SDS-polyacrylamide gel  
4 electrophoresis, said polypeptide factor having mitogenic  
5 activity stimulating the division of rat Schwann cells in  
6 the presence of fetal calf plasma, and when isolated using  
7 reversed-phase HPLC retaining at least 50% of said activity  
8 after 10 weeks incubation in 0.1% trifluoroacetic acid at  
9 4°C.

1           73. A basic polypeptide factor having a molecular  
2 weight, under non-reducing conditions, of from about 55 kD  
3 to about 63 kD on SDS-polyacrylamide gel electrophoresis,  
4 said polypeptide factor having mitogenic activity  
5 stimulating the division of rat Schwann cells in the  
6 presence of fetal calf plasma, and when isolated using  
7 reversed-phase HPLC retains at least about 50% of said  
8 activity after 4 days incubation in 0.1% trifluoroacetic  
9 acid at 4°C.

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1 74. A method for the preparation of a polypeptide  
2 defined in claim 72 or claim 73, said method comprising  
3 extracting vertebrate brain material to obtain protein,  
4 subjecting said protein to chromatographic purification  
5 comprising hydroxylapatite HPLC and thereafter to SDS-  
6 polyacrylamide gel electrophoresis and collecting that  
7 fraction therefrom which has an observed molecular weight of  
8 about 30 kD to 36 kD and/or that fraction which has an  
9 observed molecular weight of about 55 kD to 63 kD if, in  
10 either case, subjected to SDS-polyacrylamide gel  
11 electrophoresis; in the case of said smaller molecular  
12 weight fractions whether in reducing conditions or not, and  
13 in the case of said larger molecular weight fraction under  
14 non-reducing conditions, and which fraction(s) exhibit(s)  
15 mitogenic activity stimulating the division of rat Schwann  
16 cells against a background of fetal calf plasma.

1 75. A method as claimed in claim 74, wherein the  
2 brain material in said method is pituitary material.

1 76. A method as claimed in claim 75, wherein said  
2 pituitary material in said method is bovine.

1 77. A method as claimed in claim 74, wherein said  
2 protein used in said method is initially extracted from  
3 brain material is first subjected to carboxymethyl cellulose  
4 chromatography.

1 78. A method as claimed in claim 74 wherein after  
2 said hydroxylapatite HPLC, said method uses cation exchange  
3 chromatography, gel filtration, and/or reversed-phase HPLC.



1           79. A method as claimed in claim 74, wherein at  
2 each stage of said method biological activity of material  
3 obtained is assessed for mitogenic activity stimulating the  
4 division of rat Schwann cells in the presence of fetal calf  
5 plasma.

1           80. A method for assaying a substance for glial  
2 cell mitogenic activity, said method comprising contacting  
3 said substance with glial cells in the presence of fetal  
4 calf plasma, and the measuring DNA synthesis in said glial  
5 cells as a measure of glial cell mitogenic activity.

1           81. An assay as claimed in claim 80, wherein said  
2 glial cells are Schwann cells.

1           82. A DNA sequence encoding a polypeptide having  
2 glial cell mitogenic activity and comprising:

3           (a) a DNA sequence shown in any one of Figures 28a,  
4 28b, or 28c (SEQ ID Nos. 133-135)

5           (b) a DNA sequence shown in Figure 22 (SEQ ID No.  
6 89);

7           (c) the DNA sequence represented by nucleotides  
8 281-557 of the sequence shown in Figure 28a; or

9           (d) a DNA sequence hybridizable to any one of the  
10 DNA sequences according to (a), (b) or (c).

1           83. A polypeptide which is a glial cell mitogen,  
2 said polypeptide being encoded by a DNA sequence as defined  
3 in claim 82, said polypeptide obtained by a method  
4 comprising for the preparation of a glial cell mitogenic  
5 factor, said method cultivating modified host cells under  
6 conditions permitting expression of said DNA sequence.

1 84. A vector comprising a DNA sequence as defined  
2 in claim 82.

1 85. A host cell containing the isolated DNA of  
2 claim 84.

1 86. A method for the preparation of a glial cell  
2 mitogenic factor, said method comprising cultivating  
3 modified host cells as defined in claim 85 under conditions  
4 permitting expression of said DNA sequence.

1 87. A polypeptide which is a glial cell mitogen,  
2 said polypeptide being encoded by a DNA sequence as defined  
3 in claim 1, said polypeptide obtained by a method comprising  
4 for the preparation of a glial cell mitogenic factor, said  
5 method cultivating modified host cells under conditions  
6 permitting expression of said DNA sequence.

1 88. A polypeptide which is a glial cell mitogen,  
2 said polypeptide being encoded by a DNA sequence as defined  
3 in any one of claims 18-22, said polypeptide obtained by a  
4 method comprising for the preparation of a glial cell  
5 mitogenic factor, said method cultivating modified host  
6 cells under conditions permitting expression of said DNA  
7 sequence.

1 89. A method for detecting, in a sample, the  
2 presence of a molecule having a receptor binding  
3 characteristic of a polypeptide defined in any one of claims  
4 23, 40-46, 71-73, or 87, said method comprising the steps of  
5 a) contacting said sample with a polypeptide of any  
6 one of claims 22, 39-42, 63-65, 72, 73 or 80, along with a

7 receptor capable of binding specifically to said  
8 polypeptide, and  
9 b) detecting competitive inhibition of the binding  
10 of said polypeptide to said receptor as an indication of the  
11 presence of a receptor binding molecule in said sample.

1 90. A method for the prophylaxis or treatment of a  
2 glial tumor in a patient, said method comprising  
3 administering to said patient an effective amount of a  
4 substance which inhibits the binding of a factor as defined  
5 in any one of claims 23, 40-46, 71-73, or 87 to a receptor  
6 therefor.

1 91. A pharmaceutical or veterinary formulation  
2 comprising a polypeptide as defined in any of claims 23, 40-  
3 46, 71-73, or 87 formulated for pharmaceutical or veterinary  
4 use, respectively, together with an acceptable diluent,  
5 carrier or excipient and/or in unit dosage form.

1 92. A method for stimulating mitogenesis of a glial  
2 cell, said method comprising contacting said glial cell with  
3 a polypeptide as defined in any one of claims 23, 40-46, 71-  
4 73, or 87.

1 93. A polypeptide, as defined in any one of claims  
2 23, 40-46, 71-73, or 87 for use as a glial cell mitogen.

1 94. A method for stimulating mitogenesis of a glial  
2 cell in a vertebrate, said method comprising contacting said  
3 glial cell with an effective amount of a polypeptide defined  
4 in any one of claims 23, 40-46, 71-73, or 87 to glial cells.

1           95. A method for the prophylaxis or treatment of  
2 pathophysiological condition of the nervous system in a  
3 mammal in which said condition involves a cell type which is  
4 sensitive or responsive to a polypeptide as defined in any  
5 one of claims 23, 40-46, 71-73, or 87, said method  
6 comprising administering an effective amount of said  
7 polypeptide.

1           96. A method for the treatment of a condition which  
2 involves peripheral nerve damage in a mammal, said method  
3 comprising contacting said peripheral nerves with an  
4 effective amount of a polypeptide, as defined in any one of  
5 claims 23, 40-46, 71-73, or 87.

1           97. A method for the prophylaxis or treatment of a  
2 condition in a mammal in said condition involves  
3 demyelination or damage or loss of Schwann cells, for  
4 example a neuropathy of sensory or motor nerve fibers, said  
5 method comprising contacting said Schwann an effective  
6 amount of a polypeptide, as defined in any one of claims 23,  
7 40-46, 71-73, or 87.

1           98. A method for the prophylaxis or treatment of a  
2 neurodegenerative disorder in a mammal, said method  
3 comprising contacting glial cells in a mammal with an  
4 effective amount of a polypeptide as defined in any one of  
5 claims 23, 40-46, 71-73, or 87.

1           99. A method for inducing neural regeneration  
2 and/or repair in a mammal, said method comprising contacting  
3 glial cells in a mammal with an effective amount of a  
4 polypeptide as defined in any one of claims 23, 40-46, 71-  
5 73, or 87.

1 100. A method of inducing fibroblast proliferation,  
2 said method comprising contacting said fibroblasts with a  
3 polypeptide, as defined in any one of claims 23, 40-46, 71-  
4 73, or 87.

1 101. A method of wound repair in mammals, said  
2 method comprising contacting said wound with a polypeptide,  
3 as defined in any one of claims 23, 40-46, 71-73, or 87.

1 102. A method of making a medicament comprising  
2 admixing a polypeptide as defined in any one of claims 23,  
3 40-46, 71-73, or 87 with a pharmaceutically acceptable  
4 carrier.

1 103. A method for producing an antibody, said method  
2 comprising immunizing a mammal with a polypeptide of any one  
3 of claims 23, 40-46, 71-73, or 87.

1 104. A method for detecting, in a sample, the  
2 presence of a molecule having a receptor binding  
3 characteristic of a polypeptide defined in any one of claims  
4 23, 40-46, 71-73, or 87, said method comprising the steps of

5 a) contacting said sample with a polypeptide of any  
6 one of claims 23, 40-46, 71-73, or 87, along with a receptor  
7 capable of binding specifically to said polypeptide, and

8 b) detecting competitive inhibition of the binding  
9 of said polypeptide to said receptor as an indication of the  
10 presence of a receptor binding molecule in said sample.

1 105. A method for detecting a receptor which capable  
2 of binding to a polypeptide as defined in any one of claims  
3 23, 40-46, 71-73, or 87, said method comprising carrying out

4 affinity isolation and sample using a said peptid as  
5 the affinity ligand.

1 106. A method for the prophylaxis or treatment of a  
2 glial tumor in a patient, said method comprising  
3 administering to said patient an effective amount of a  
4 substance which inhibits the binding of a factor as defined  
5 in any one of claims 23, 40-46, 71-73, or 87 to a receptor  
6 therefor.

1 107. A peptide selected from the following:-

2 F K G D A H T E  
3 A S L A D E Y E Y M X K  
4 T E T S S S G L X L K  
5 A S L A D E Y E Y M R K  
6 A G Y F A E X A R  
7 T T E M A S E Q G A  
8 A K E A L A A L K  
9 F V L Q A K K  
10 E T Q P D P G Q I L K K V P M V I G A Y T  
11 E Y K C L K F K W F K K A T V M  
12 E X K F Y V P  
13 K L E F L X A K  
14 V H Q V W A A K  
15 Y I F F M E P E A X S S G  
16 L G A W G P P A F P V X Y  
17 W F V V I E G K  
18 A S P V S V G S V Q E L V Q R  
19 V C L L T V A A L P P T  
20 K V H Q V W A A K  
21 K A S L A D S G E Y M X K  
22 D L L L X V

1 108. A DNA sequence as shown in any one of Figures  
2 28a, 28b and 28c (SEQ ID No. 133-135, respectively).

1 109. A polypeptide encoded by a DNA sequence as  
2 defined in claim 108 (SEQ ID Nos. 133-135).

1 110. An antibody to a polypeptide as defined in  
2 claim 107.

1 111. A method of investigating, isolating or  
2 preparing a glial cell mitogen or gene sequence encoding  
3 said glial cell mitogen, said method comprising contacting  
4 tissue preparations or samples with an antibody, said  
5 antibody prepared as defined in claim 103.

1 112. A method for isolating a nucleic acid sequence  
2 coding for a molecule having glial cell mitogenic activity,  
3 said method comprising contacting a cell containing sample  
4 with a glial cell mitogen specific antibody to determine  
5 expression of said mitogen in said sample and isolating said  
6 nucleic acid sequence from the cells exhibiting said  
7 expression.

1 113. The purified GGF2 polypeptide comprising the  
2 amino acid sequence shown in Fig. 45 herein (SEQ ID No.  
3 167).

1 114. A purified GGF2 DNA encoding the GGF2  
2 polypeptide whose sequence is shown in Fig. 45 (SEQ ID No.  
3 167).

1 115. A method for inducing myelination of a neural  
2 cell by a Schwann cell, said method comprising contacting

3 said Schwann cell with a polypeptide of any one of claims  
4 23, 40-46, 71-73, or 87.

1 116. A method for inducing acetylcholine receptor  
2 synthesis in a cell, said method comprising contacting of  
3 said cell with a polypeptide of any one of claims 23, 40-46,  
4 71-73, or 87.

1 117. An antibody to a polypeptide as defined in  
2 claim 23.

1 118. An antibody to a polypeptide as defined in  
2 claim 40.

1 119. An antibody to a polypeptide as defined in  
2 claim 41.

1 120. An antibody to a polypeptide as defined in  
2 claim 42.

1 121. An antibody to a polypeptide as defined in  
2 claim 43.

1 122. An antibody to a polypeptide as defined in  
2 claim 44.

1 123. An antibody to a polypeptide as defined in  
2 claim 45.

1 124. An antibody to a polypeptide as defined in  
2 claim 46.

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1 125. An antibody to a polypeptide as defined in  
2 claim 71.

1 126. An antibody to a polypeptide as defined in  
2 claim 72.

1 127. An antibody to a polypeptide as defined in  
2 claim 73.

1 128. An antibody to a polypeptide as defined in  
2 claim 87.

1 129. A method of purifying a protein with glial cell  
2 mitogenic activity, said method comprising contacting a cell  
3 extract with an antibody of any one of claims 117-128.

1 130. A method of treating a mammal suffering from a  
2 disease of glial cell proliferation, said method comprising  
3 administering to said mammal an antibody of any one of  
4 claims 117-128.

1 131. A vector comprising a DNA sequence as defined  
2 in any one of claims 1 or 18-22.

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add 92

add 8